# SPEC® MPIL2007 Result

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## NEC

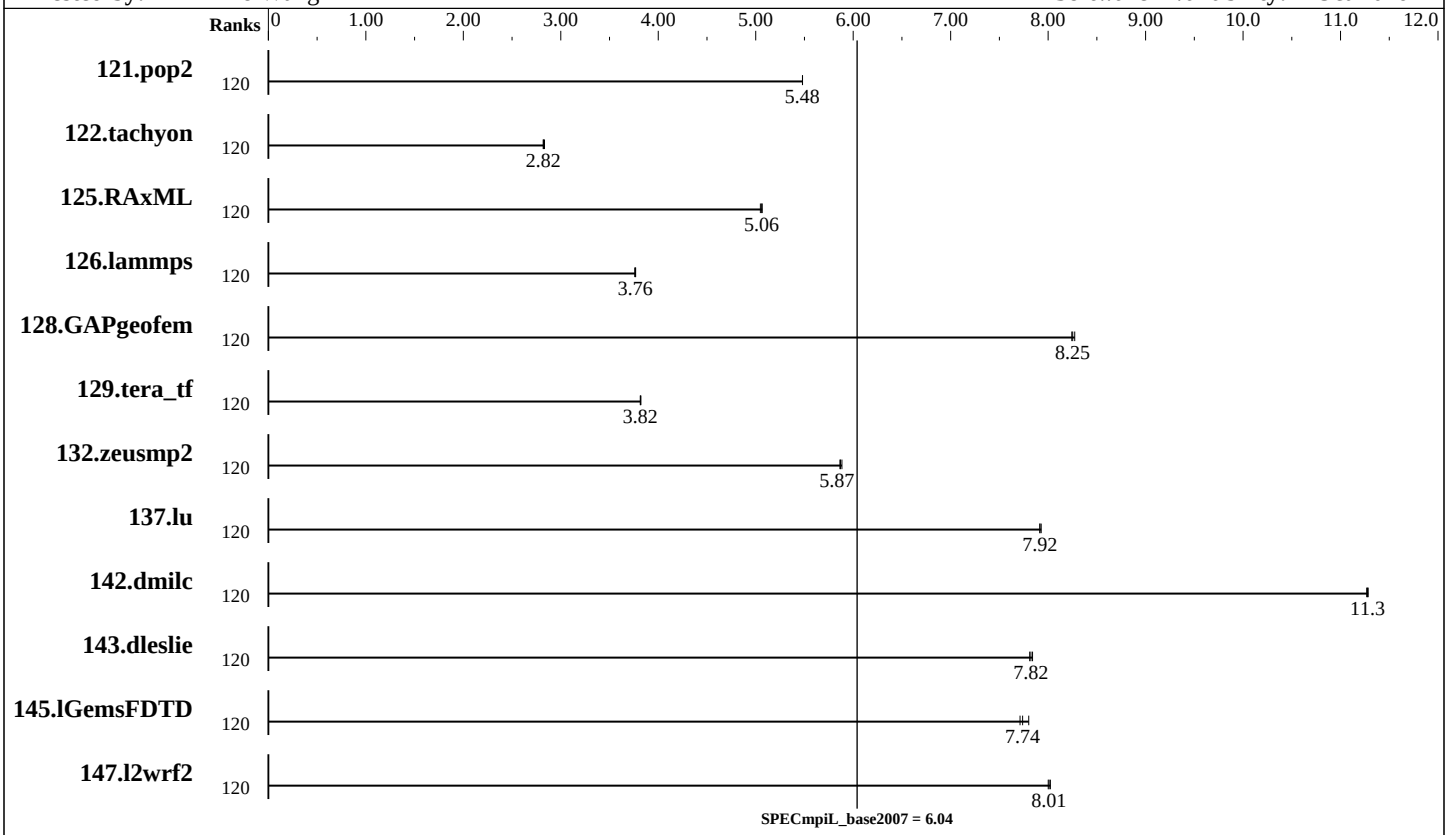
NEC HPC1812Rg-2 (Intel Xeon E5-2650 v4, 2.20 GHz, DDR4-2400 MHz, SMT ON, Turbo ON)

SPECmpiL_peak2007 = Not Run

SPECmpiL_base2007 = 6.04

**MPI2007 license:** 055A
**Test sponsor:** RWTH University Aachen
**Tested by:** Bo Wang

**Test date:** Sep-2017
**Hardware Availability:** Oct-2016
**Software Availability:** Oct-2016




## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 121.pop2 | 120 | **710** | **5.48** | 710 | 5.48 | 710 | 5.48 | | | | | | | |
| 122.tachyon | 120 | **689** | **2.82** | 689 | 2.82 | 686 | 2.83 | | | | | | | |
| 125.RAxML | 120 | 576 | 5.07 | 578 | 5.05 | **577** | **5.06** | | | | | | | |
| 126.lammps | 120 | 653 | 3.77 | 654 | 3.76 | **653** | **3.76** | | | | | | | |
| 128.GAPgeofem | 120 | 720 | 8.24 | **719** | **8.25** | 717 | 8.27 | | | | | | | |
| 129.tera_tf | 120 | 288 | 3.82 | 288 | 3.82 | **288** | **3.82** | | | | | | | |
| 132.zeusmp2 | 120 | **361** | **5.87** | 360 | 5.88 | 362 | 5.86 | | | | | | | |
| 137.lu | 120 | **531** | **7.92** | 530 | 7.93 | 531 | 7.91 | | | | | | | |
| 142.dmilc | 120 | **327** | **11.3** | 326 | 11.3 | 327 | 11.3 | | | | | | | |
| 143.dleslie | 120 | 395 | 7.84 | 397 | 7.81 | **396** | **7.82** | | | | | | | |
| 145.lGemsFDTD | 120 | 565 | 7.80 | **570** | **7.74** | 572 | 7.71 | | | | | | | |
| 147.l2wrf2 | 120 | 1023 | 8.02 | **1024** | **8.01** | 1025 | 8.00 | | | | | | | |

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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**Software Availability:** Oct-2016

### Hardware Summary

| | |
|---|---|
| Type of System: | Homogeneous |
| Compute Node: | NEC HPC |
| Interconnects: | Omni-Path Architecture<br>Gigabit Ethernet |
| File Server Node: | NFS |
| Total Compute Nodes: | 5 |
| Total Chips: | 10 |
| Total Cores: | 120 |
| Total Threads: | 240 |
| Total Memory: | 640 GB |
| Base Ranks Run: | 120 |
| Minimum Peak Ranks: | -- |
| Maximum Peak Ranks: | -- |

### Software Summary

| | |
|---|---|
| C Compiler: | Intel C++ Composer XE 2017 for Linux, Version 17.0.2.174 |
| C++ Compiler: | Intel C++ Composer XE 2017 for Linux, Version 17.0.2.174 |
| Fortran Compiler: | Intel Fortran Composer XE 2017 for Linux, Version 17.0.2.174 |
| Base Pointers: | 64-bit |
| Peak Pointers: | 64-bit |
| MPI Library: | Intel MPI Library 2017 for Linux, Version 2017.1.132 |
| Other MPI Info: | None |
| Pre-processors: | No |
| Other Software: | None |

## Node Description: NEC HPC

### Hardware

| | |
|---|---|
| Number of nodes: | 5 |
| Uses of the node: | compute |
| Vendor: | Intel |
| Model: | NEC HPC 1812Rg |
| CPU Name: | Intel Xeon E5-2650 v4 |
| CPU(s) orderable: | 1-2 chips |
| Chips enabled: | 2 |
| Cores enabled: | 24 |
| Cores per chip: | 12 |
| Threads per core: | 2 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 2.9 GHz (single)/2.2 GHz (all), 9.6 GT/s QPI, Hyper-Threading enabled |
| CPU MHz: | 2200 |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 256 KB I+D on chip per core |
| L3 Cache: | 30 MB I+D on chip per chip shared / 12 cores |
| Other Cache: | None |
| Memory: | 128 GB (8 x 16 GB 2Rx8 PC4-2400T-R) |
| Disk Subsystem: | SATA, Samsung SM863, 120GB, SSD |
| Other Hardware: | None |
| Adapter: | Intel Omni-Path Host Fabric Interface Adapter 100 Series 1 Port PCIe X8 |
| Number of Adapters: | 1 |
| Slot Type: | PCI-E x8 |
| Data Rate: | 58Gb/s |
| Ports Used: | 1 |
| Interconnect Type: | Omni-Path |

### Software

| | |
|---|---|
| Adapter: | Intel Omni-Path Host Fabric Interface Adapter 100 Series 1 Port PCIe X8 |
| Adapter Driver: | hfi1 |
| Adapter Firmware: | 2.33.5100 |
| Operating System: | CentOS Linux release 7.3.1611 (Core) |
| Local File System: | Linux/xfs |
| Shared File System: | NFS |
| System State: | Multi-User |
| Other Software: | None |

## Node Description: NFS

### Hardware

| | |
|---|---|
| Number of nodes: | 1 |
| Uses of the node: | fileserver |
| Vendor: | NETAPP |
| Model: | FAS6240 |
| CPU Name: | Intel Xeon CPU X5670 |
| CPU(s) orderable: | 1-2 chips |
| Chips enabled: | 2 |
| Cores enabled: | 12 |
| Cores per chip: | 6 |
| Threads per core: | 2 |
| CPU Characteristics: | None |
| CPU MHz: | 2930 |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 256 KB I+D on chip per core |
| L3 Cache: | 12 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 96 GB |
| Disk Subsystem: | 216 disks, 2 TB/disk, 432TB total |
| Other Hardware: | None |
| Adapter: | 10 Gigabit Ethernet Controller IX1-SFP+ |
| Number of Adapters: | 2 |
| Slot Type: | PCI-Express x8 |
| Data Rate: | 10Gbps Ethernet |
| Ports Used: | 2 |
| Interconnect Type: | Ethernet |

### Software

| | |
|---|---|
| Adapter: | 10 Gigabit Ethernet Controller IX1-SFP+ |
| Adapter Driver: | N/A |
| Adapter Firmware: | 1.8-0 |
| Operating System: | NetApp Release 8.2.3P2 7-Mode |
| Local File System: | None |
| Shared File System: | NFS |
| System State: | Multi-User |
| Other Software: | None |

## Interconnect Description: Omni-Path Architecture

### Hardware

| | |
|---|---|
| Vendor: | Intel |
| Model: | Intel Omni-Path 100 Series |
| Switch Model: | Intel Omni-Path 100 Series |
| Number of Switches: | 25 |
| Number of Ports: | 48 |
| Data Rate: | 100Gbps |
| Firmware: | 10.3.0.0.81 |
| Topology: | 2:1 Blocking Fat tree |
| Primary Use: | MPI traffic |

### Software

## Interconnect Description: Gigabit Ethernet

| Hardware | | Software |
|---|---|---|
| Vendor: | Cisco | |
| Model: | Ethernet 40 Gbps | |
| Switch Model: | Cisco Nexus5020, N5K-C5020P-BF | |
| Number of Switches: | 1 | |
| Number of Ports: | 96 | |
| Data Rate: | 40Gbps | |
| Firmware: | 5.2(1)N1(9a) | |
| Topology: | Star | |
| Primary Use: | Cluster File System | |

## Submit Notes

```
The config file option 'submit' was used.
```

## Base Compiler Invocation

C benchmarks:
`mpiicc`

C++ benchmarks:

126.lammps: `mpiicpc`

Fortran benchmarks:
`mpiifort`

Benchmarks using both Fortran and C:
`mpiicc mpiifort`

## Base Portability Flags

121.pop2: `-DSPEC_MPI_CASE_FLAG`
126.lammps: `-DMPICH_IGNORE_CXX_SEEK`

## Base Optimization Flags

C benchmarks:
`-O3 -xCORE-AVX2 -no-prec-div`

C++ benchmarks:

Continued on next page

## Base Optimization Flags (Continued)

126.lammps: `-O3 -xCORE-AVX2 -no-prec-div`

Fortran benchmarks:
`-O3 -xCORE-AVX2 -no-prec-div`

Benchmarks using both Fortran and C:
`-O3 -xCORE-AVX2 -no-prec-div`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/mpi2007/flags/RWTH-Aachen-CLAIX-MPI-2017-SEP.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/mpi2007/flags/RWTH-Aachen-CLAIX-MPI-2017-SEP.xml`


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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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